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## THE ELECTRIC LIGHT SYSTEM AT APPLETON

LOUISE P. KELLOGG

The faith of Wisconsin business men in the epochal inventions of the nineteenth century is illustrated by the action of a group of Appleton citizens with regard to the electric light. Thomas A. Edison had been for some time developing the incandescent electric light, machines and apparatus for supplying power for this purpose. In the winter of 1880-81 a central station for demonstration purposes was in operation at Menlo Park, New Jersey; in the year 1882 the Edison central-station utility was available for public use. The first commercial central station was erected in London and put into service in April of that year, but did not become a permanent institution in the English metropolis. Before that time, however, plans were being carried out for the utilization of this means of lighting in the United States. In December, 1880, the Edison Electric Illuminating Company of New York was organized, the first corporation on a permanent basis to develop the Edison central-station system. In May of the next year property in Pearl Street, New York City, was acquired, and the work of laying the underground conductors was begun. Not until September 4, 1882, was the Pearl Street station placed in permanent occupation.

Meanwhile the Western Edison Electric Light Company of Chicago had been incorporated May 25, 1882, under the laws of Illinois, with territorial rights for Illinois, Wisconsin, and Iowa. This company was the predecessor of the present Commonwealth Edison Company.<sup>1</sup> Forty years ago this summer, therefore, Edison's electric-lighting system was first placed upon the market in the West. A group of Appleton mill owners and citizens had the enterprise and

<sup>1</sup> Letters of William E. Keily, June 20 and Aug. 29, 1922, Chicago.

the foresight to experiment with this new system of lighting, and thus to make their city of note in the annals of electricity.

Some time in July one of the engineers of the Western Edison Light Company, P. D. Johnston, was invited to Appleton to explain the new lighting system to a group of its business men, of whom H. J. Rogers was the leader.<sup>2</sup> Rogers, who was the president of the Appleton Paper and Pulp Company, was at the time building a new residence on Prospect Avenue on the heights overlooking the river; he and his associates became very much interested, and determined to test the possibilities of electricity for lighting both their mills and their homes. They hoped in time to extend its use still farther, for the *Crescent* said, "Some of our capitalists are determined to light College Avenue by electricity if they pay for it themselves."<sup>3</sup>

After satisfying themselves by examination that the new system was practicable, the Appleton investors entered into a contract with the Western Edison Light Company for two Edison "K" dynamos of a capacity to carry 550 lamps, to be driven by water power.<sup>4</sup> This contract was signed August 18, and some time after that Edward T. Ames, a construction man and electrician, was sent from Chicago to install the plant in the paper company's property.<sup>5</sup>

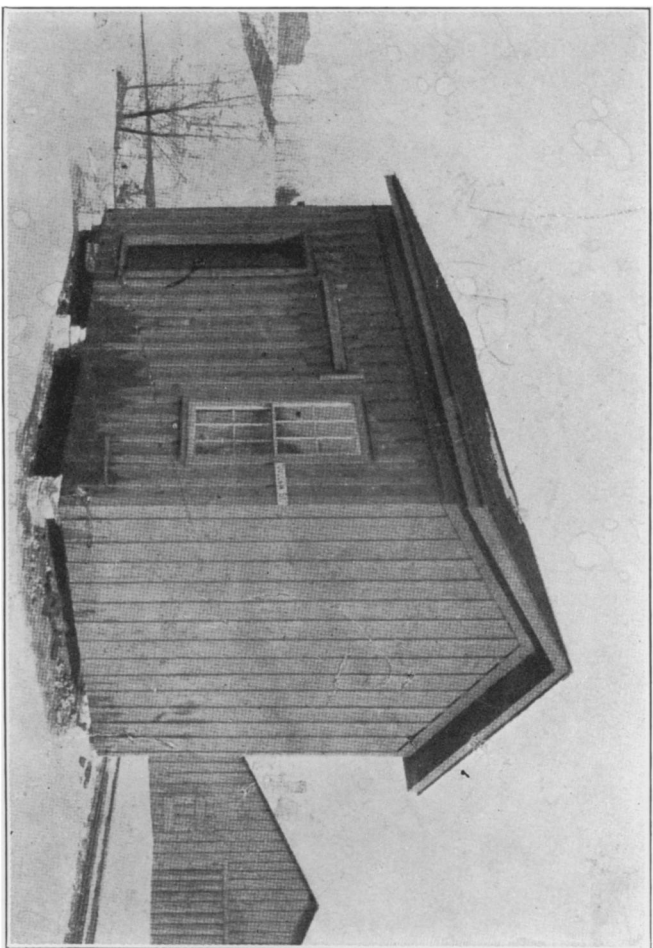
The historical question at issue has been the length of time required for the wiring and adjusting, and the date on which the power was first successfully applied to produce light. It has been stated on high authority that the Appleton plant was the first central lighting plant opened in the United States. The Pearl Street generating station in

<sup>2</sup> *Appleton Crescent*, July 29, 1882. Johnston, who was a mechanical rather than an electrical engineer, worked for the Western Edison Light Company from 1882 to 1885.

<sup>3</sup> Aug. 12, 1882.

<sup>4</sup> Letters of William E. Kelly, cited above.

<sup>5</sup> Mr. Ames died in St. Joseph, Michigan, in February, 1922.



**FIRST ELECTRIC LIGHT PLANT AT APPLETON**

New York City was, as we have seen, opened September 4, 1882. Some of the claimants for the Appleton priority have asserted that this plant began operations as early as August. The finding of the record of the contract in the Commonwealth Edison Company's files, and the contemporary statements of the local press, prove that it took nearly six weeks to install the first dynamo in the paper mill near the upper dam at Appleton. Although not the first in the United States, the Appleton system was the earliest in use in the West, and the first to be operated by water power.

The mill in which Mr. Ames installed the first dynamo in the West was what was known as a beater mill, containing two new beating machines recently acquired by the paper company. Both this mill and another belonging to the same company a mile farther east were wired, as well as the new residence of President Rogers.

About this time a rumor circulated throughout the city that Mr. Rogers, who was president of the local gas company, was merely buying the electric rights in order to keep them from competing with his gas business, and that there was no intention of actually utilizing the contract with the Edison people for lighting purposes. Investigation proved this to be an idle rumor. Early in September the reporter sent to examine the matter found that both the mill and the Rogers residence were being wired and "if it [the electric light] proves an unquestioned success, as of course it cannot fail to, then the light will be substituted generally for gas in all our public and private buildings and the gas will be cheapened, used for heating, cooking, and running light machinery."<sup>6</sup> Thus the Appletonians proved themselves true prophets and ready believers in American inventiveness.

By the twenty-third of September the newspapers

<sup>6</sup> *Appleton Crescent*, Sept. 9, 1882.

announced that one of the generators had arrived, and that a test of the new lights would be made the next week. On Wednesday, the twenty-seventh of the month, all was ready for the test, but upon the application of the power the lights failed to appear. It was supposed that the failure was due to the excessive moisture caused by the steam of the mill, and proposals for insulating the copper wires were made. Meanwhile, however, Mr. Ames had been summoned by telegraph from Chicago; he immediately detected some slight error in the arrangements, which he was able to eliminate. Saturday, September 30, the power was once more applied to the dynamos. Then there burst from the hanging pear-shaped globes the pure, steady, incandescent light with which the world has since grown so familiar. The experiment was an approved success, the faith of the mill owners was justified; so enthusiastic did the observers become that the buildings illuminated were declared to be "as bright as day."<sup>7</sup> About the same time the experiment was tried with gratifying success in the residence of Mr. Rogers. This was the first residence in the West to be exclusively lighted by the Edison system.

The water wheel used to drive the dynamo was the same one which drove the new beating machines, and because of the varying loads carried by the beaters, the speed of the water wheel and of the dynamo greatly varied. Sometimes the voltage was so high that all the lamps in the circuit were burned out. After a number of experiences of this kind, the dynamo was removed to another part of the building and driven by a wheel of its own. The second dynamo called for in the contract was originally installed in the Vulcan mill at the opposite end of the city. But the owners soon decided to erect a central building between the two mills, and a small frame shack was quickly raised to which both dynamos were transferred. This building was

<sup>7</sup> *Crescent*, Oct. 7, 1882.

the first central station for commercial incandescent light in the West, the precursor of the great generating stations of today found in all our cities. By December, 1882, three or more residences, five or six mills, and a blast furnace were lighted by the Edison bulbs. The local paper boasted that Appleton then had more electrically lighted buildings than any other city in the United States.<sup>8</sup>

Some of the appliances of the original plant are still in existence,<sup>9</sup> and the first engineer, William D. Kurz, is still engaged in electric service at Appleton. From Mr. Kurz's recollections some of the early experiences in operating the plant are given.<sup>10</sup> There were no meters or gauges of any kind, the operator's eyes being the only gauge. Service was from dusk to daylight only, so all lights came on in the evening as soon as the service was started. The customers paid a flat rate per month; the monthly receipts at first totaled barely \$300. Each lamp for all-night service was paid for at the rate of \$1.20 per month; if used only till ten o'clock in the evening, the rate was eighty-four cents a month. All customers bought their own outfits. The lamps cost \$1.60 apiece, and their filaments were of bamboo.

"One of the popular pastimes in the early days," writes Mr. A. C. Langstedt of Appleton, "was the hunting out and cleaning up of short circuits. These mains and feeders in the early years were all of bare copper wire. . . . A little windstorm, or anything out of the ordinary, a branch

<sup>8</sup> *Crescent*, Dec. 2, 1882. According to the Edison Electric Illuminating Company *Bulletin* for Oct. 14, 1882, the second dynamo was used to light the residences of H. D. and A. L. Smith, the Appleton Blast Furnace, A. W. Patten's Paper Mill, Fleming's Linen Mill, and the Appleton Woolen Mill. According to the same publication for Apr. 6, 1883, the lights were placed in the Waverly Hotel early in January, and gave perfect satisfaction. This information was furnished by Charles E. Neil, present editor of the *National Electric Light Association Bulletin*.

<sup>9</sup> A lamp and socket taken from the original plant and mounted on a board with portions of the machinery have lately been presented to the Historical Museum at Madison.

<sup>10</sup> These experiences were embodied in a paper read, Mar. 24, 1922, before the Wisconsin Electrical Association by A. C. Langstedt, himself connected with the operating of the first station.

falling off a tree, would fall against these wires and short circuit them, and then the company shut down the plant, as it had no fuse protection, and all hands had to go out and find where the trouble was. It took sometimes an hour and sometimes a day and in the mean time there was no service."

Such were the humble beginnings of the Edison electric central-station service in the West. A few years later Appleton obtained an electric railway, which was purchased by the lighting company, and the consolidated properties were operated by the Appleton Edison Light Company. This has now become the Wisconsin Traction Light, Heat and Power Company, which supplies fourteen surrounding municipalities and villages, runs the interurban railway, and operates its power lines over an area of more than fifty square miles.

The enterprise of the early Appleton business men has thus been more than justified. "Appleton," writes, Mr. T. Commerford Martin,<sup>11</sup> one of the chief collectors of Edisoniana, "will ever remain high on the list of notable plants, with claims to real distinction that no discovery of conflicting dates can disturb. There is merit and glory enough for every pioneer plant and person in this utterly modern field of advance."

<sup>11</sup> Letter to the present writer, June 12, 1922.